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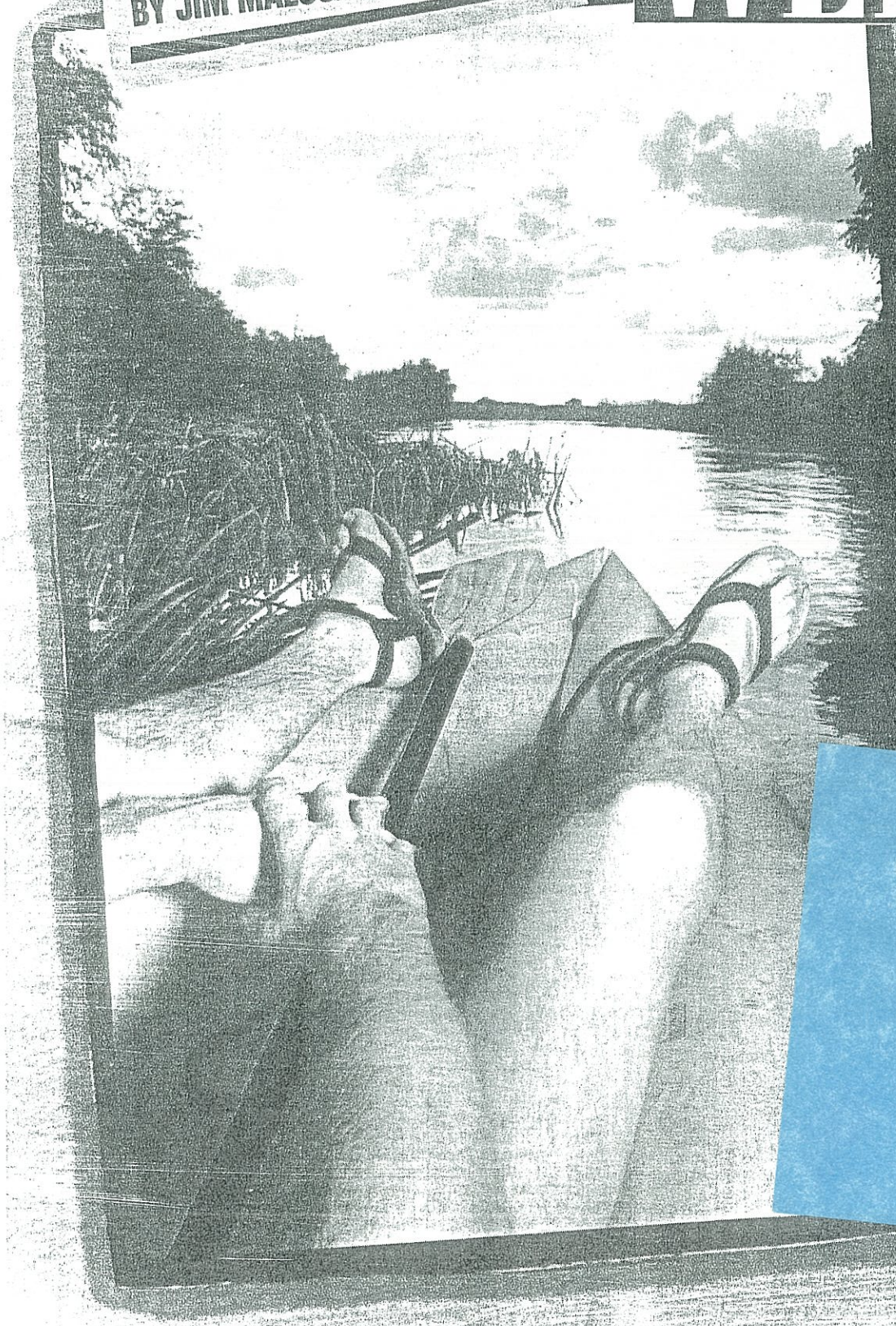
TUCSON WEEKLY

A SEWER SAGA

Most of the year the Santa Cruz north of Roger Road is the only place near Tucson where the river has water — treated sewage. Enough even to float a boat on...

BY JIM MALUSA



JEFF SMITH: Father's Day At The Smith's

OFF BASE: Rose Deposed

MENU: Savory Maxwell's

BEST OF TUCSON: Last Chance To Vote

1990 BOATING the SANTA CRUZ in TUCSON

Cruising The Effluent

...Or, Up Shit Creek With Two Paddles

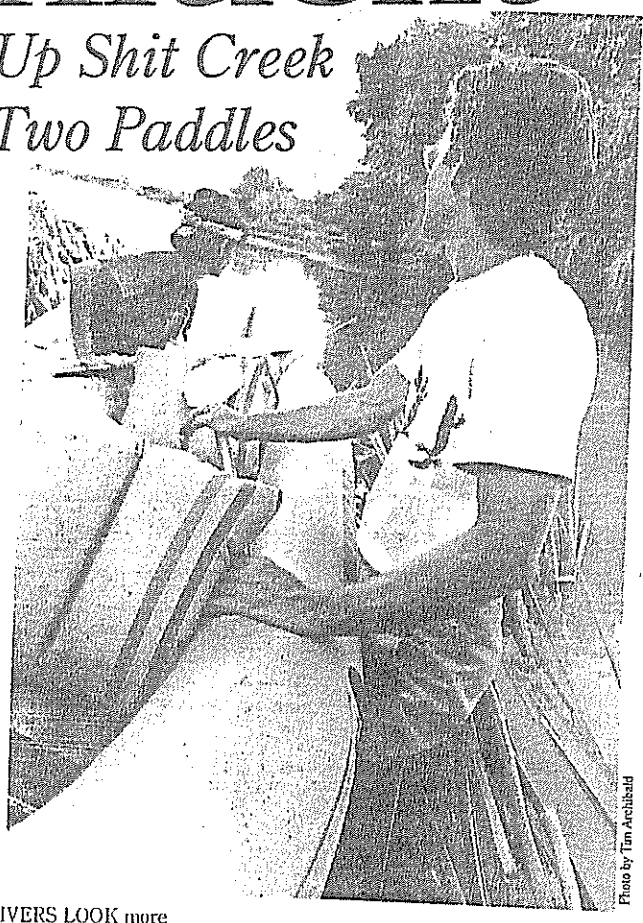


Photo by Tim Archibald

With an inflatable boat and explorers' spirits, author Jim Malusa and his wife Sonya Norman floated the 10-mile stretch of treated sewage in the Santa Cruz.

BY JIM MALUSA

FEW RIVERS LOOK more desperate than the Santa Cruz near downtown Tucson. Squeezed between freeway and power lines, straightened by blueprint and bulldozer, it is more canal than river. To add insult, most of the time it's an empty canal. There's no water.

Yet only 10 miles downstream, as the Santa Cruz winds north toward Marana and beyond, the river runs year round. From this perennial water life flows: from algae to bug to bird. Very big birds, big enough to provide shade if they would only stay still. They're all here because of millions of gallons of water that pours into the streambed each day between Roger and Ina roads—treated effluent, courtesy of Pima County Wastewater Management. You say sewage, I say Santa Cruz.

This is where the water goes after it spirals down the sink and shower, tub and toilet. Even though the water's been treated, its origins are reason enough for most people to keep their distance.

But I had a little inflatable boat and a powerful interest in what lay north of the Ina Road bridge. So we went, my wife Sonya and I, wastewater rafting down the river some 10 miles to Avra Valley Road.

A few days later, having failed to die from infectious diseases, I called the Pima County Wastewater Treatment Plant at Roger Road (there's a second plant nearby at Ina Road) to find out if rafting the effluent was a good idea or a bad idea. Plant Superintendent Don Armstrong said we shouldn't have any problems, so long as we didn't drink the stuff.

On the other hand, the river of effluent may soon be no more. Soon, the only free-flowing stretch of the Santa Cruz near Tucson may be shut off like a garden hose, before most locals knew it existed.

The problem is straightforward: the county says the effluent is clean enough to be discharged into the Santa Cruz, while state and federal agencies say it isn't. Meeting tougher discharge standards could cost the county up to $200 million, and no county employee has dared say it's worth it. Because standards for agricultural use of effluent are less stringent than for aquatics and wildlife, Pima County is pushing hard to send the Santa Cruz effluent flow—all of it—in a canal or pipe to Marana area farms.

Unfortunately, the river and its inhabitants are utterly dependent on the effluent flow. If Pima County diverts the water there will be nothing but sand left in this stretch of the Santa Cruz, an ironic consequence of state and federal efforts to clean up the flow.

SONYA AND I are cheerfully ignorant of all this the morning we slip our inflatable kayak into the Santa Cruz. We fancy ourselves a hardy breed of pioneer wastewater rafters, tight-lipped, with eyes peeled for potentially offensive floating matter. It's a warm morning in late April, with torn clouds drifting above, and a south wind carrying the cotton puff seeds of the riverbank willows. The stream is quick and turbid, about eight feet wide and eight inches deep.

"We are ready to start on our way down the Great Unknown," wrote John Wesley Powell in 1869, before rowing off into the Grand Canyon of the Colorado River.

"It doesn't stink!" says Sonya—and the current takes us away.

Into a jungle of overarching willows, salt cedars topped with purple blooms, cattails crowding the stream's edge. We paddle for fun, then stop and drift. We hear the whistles and trills and shrieks of birds strange and fantastic. Birds with needle beaks and insanely thin, red legs bent like soda straws: the black-necked stilt. We round a bend to see mallards, with webbed feet and iridescent green heads, springing out of the water, stretching into the wind. Dozens of red-winged blackbirds swoop and yak, looking like compact ravens streaked with red fingerpaint.

Whitewater ahead. We hope for something dangerous—a rapid, or a waterfall—but the boat just grinds to a halt on the shallow bottom. We drag it through the midget waves of what we christen Redworm Rapid for the little creatures we see clinging to the grains of sand and small cobbles.

Later I learn they are not worms, but the larvae of chironomid flies. They're red because their blood contains hemoglobin, the same molecule that human blood uses to grab oxygen molecules. Chironomid larvae are common here, and other species are absent, because the stream is low in dissolved oxygen, much of which has been consumed by organic wastes in the effluent. Also, the water is warm—my little thermometer shows 80 degrees—and a warm stream, like warm beer, holds less dissolved gas than a cold stream. Active fish like trout live in cold, high oxygen streams. The Santa Cruz is not a trout stream.

But it could be. Raw sewage can be treated to any standard, even sterilized for infant formula—for a price. But it's far cheaper to simply eliminate solids and reduce organic wastes from sewage and get drinking water from wells. Pima County treats sewage through mechanical filtration and settling tanks, then a host of hungry bacteria get to eat the biological wastes. Finally, disinfection with chlorine.

Some 20 percent of the effluent is reused, mainly for irrigation, and the rest goes into this usually dry channel of the Santa Cruz. When the flow is high the river runs 30 miles to Red Rock, near Picacho Peak. Along the way the water is used by wildlife, evaporates, or seeps through the sands back down into the aquifer from which it came.

BOAT TRAFFIC IS minimal; we see nobody else. In fact, we see almost nothing but the sky and the crest of the Tucson Mountains, all else hidden behind parallel walls of water-loving plants. There's not much trash: an occasional tire embedded in the sand and on the bank, an old stove perforated with bulletholes like Bonnie and Clyde's car.

We glide on, Sonya paddling while I play naturalist, peering through my binoculars at mildly peeved waterfowl, flipping through my bird book. I drop everything when something feathered and bigger than my head bursts out of one thicket and disappears into another without a sound. There's only one bird that big, that quiet and with talons that long: the great horned owl, a predator capable of deflating our flimsy boat in five seconds.

We stop in the shade under a bridge and break out the survival gear: a Tucson road map and a can of Milwaukee's Best. We open both, and determine our location to be the Cortaro Road Bridge.

This is where the Arizona Department of Environmental Quality (ADEQ) monitors the water quality, retrieving samples every other month for lab analysis. Every three years the ADEQ evaluates water quality standards. A 1987 amendment to the federal Clean Water Act requires that states adopt specific criteria for toxic pollutants that will protect the "designated use" of a stream

We fancy ourselves a hardy breed of pioneer wastewater rafters, tight-lipped, with eyes peeled for potentially offensive floating matter.

or lake. The ADEQ, prompted by the U.S. Fish and Wildlife Service, has set the designated use of the Santa Cruz as "Aquatic and Wildlife."

Among their primary interests are the levels of chlorine and ammonia, a nitrogenous endproduct of humans digesting protein. Standards for chlorine and ammonia are determined by a variety of methods, including studies of typical warm stream inhabitants, such as minnows. Where the effluent enters the Santa Cruz, and for some distance downstream, the levels of ammonia and chlorine are usually at levels that would kill many aquatic organisms.

Also monitored is the less common but more ominous mercury. A heavy metal which can kill or cause deformities in exceedingly small doses, mercury has the unfortunate tendency to bioaccumulate: organisms ingest it while feeding, unwittingly store it in body tissues, then pass it on in an intensifed dose to whatever eats them. Mercury occasionally appears at high levels in the effluent. So do phenols, organic acids common in cleaning products like Lysol. They impart an evil taste to fish, and in some instances are also toxic. With the exception of chlorine, which is intentionally added to the effluent, none of these pollutants is removed by the current wastewater facilities.

And why would we bother?

"I love wildlife," asserts Superintendent Armstrong, "and I bring the Boy Scouts down for their soil and water conservation merit badge." He's aware that chlorine is toxic to some aquatics, but the whole point of of a disinfectant is to kill potentially infectious bacteria and microbes. Ammonia is toxic too, but both ammonia and chlorine are reduced to non-toxic levels by sunlight and plants once the Santa Cruz reaches Marana, about 15 miles downstream.

Is it worth an estimated $200 million dollars to reduce the ammonia and chlorine in the effluent to increase the number of aquatic species in a historically dry section of the Santa Cruz?

"For that money we could buy a 747 and fly everyone to San Diego to see

The amount of water in the Santa Cruz varies greatly. The river level pictured is after recent monsoons. At the time of the rafting trip described there was only effluent in the riverbed and the water level was much lower. For more information on the effluent flow call the Roger Road treatment plant at 888-1909.

some aquatics," jokes Armstrong.

Heavy metals and phenols can only be controlled by keeping them out of the sewers. Pima County currently spends about a million dollars a year to keep out various pollutants, with inspections and "sewer cops" to trace the source of violations. The proposed standards for the effluent would require even stronger limits on what goes down the drain.

Dentists, for example, may need to install systems to filter out the tiny bits of amalgam that their patients spit out. This "silver filling" contains mercury. The county and the Arizona State Dental Association claim it's inert mercury, harmless, and not bioaccumulative.

The EPA disagrees. They point out that waterfowl, including game birds, are dependent on the effluent. Why shouldn't the county and the dentists be required to protect the birds the effluent attracts?

Because, says Engineer John Davis of Pima County Wastewater, "The cost of more stringent controls is unknown. When the industry types come moaning to us, all we can say is, 'Look, we tried to keep things reasonable.' "

LUNCHTIME ON THE river. We deserve it after surviving Blind Man Rapid, so named because it's impossible to scout, especially if you happen to be looking the wrong way, which we were. Suddenly we had to make a hard left, between a marooned tumbleweed and a willow hanging into the stream. We hit the willow, sending up a cloud of tufted seeds and delicate lacewings, insects with translucent green wings.

On a shady sandbar we eat peanut butter and jelly sandwiches, slice Willcox apples, munch on carrots: a lunch Mom would be proud of. The riverbank is lined with mint bushes and tree tobacco, each waving flowers, each vying for the attention of pollinators. Out of the bushes struts a noisy, long-legged bird with two black rings around its neck. The book says it's a killdeer, so named for its call, which to me sounds nothing at all like "killdeer." I was never a Scout.

AND PIMA COUNTY needs more than a merit badge to discharge effluent into the Santa Cruz riverbed. Without a federal permit from the Environmental Protection Agency, it faces heavy fines. Meeting the proposed standards would likely cause sewer fees to double or triple and, says Pima County's Davis, "People presumably do not want to pay a penny more in user fees—or at least that's the Board of Supervisors' view."

No permit would be needed if there were no discharge into the Santa Cruz (which, being connected to the Gila and Colorado rivers, is considered a "waterway of the United States"). So the Board has "acted aggressively to get the water out of the Santa Cruz," Armstrong says.

Board member Ed Moore would have a fine view of the Santa Cruz from his 11th story office window, but when I visit the shades are drawn. It is an office of strong opinions and stronger smells, the predominant odor being cigar, an Hoyo de Monterrey Largo Elegante. "Do you mind?" he asks politely.

Moore doesn't conceal his disdain for those who don't see the advantages of taking the effluent out of the Santa Cruz. "In Israel, they'd hang people for throwing that water away."

But isn't there considerable recharge to the aquifer?

"Much of that goes to Pinal County," asserts Moore, implying that it might as well go to Jupiter. "When we remove the water from the riverbed," he continues, "we remove the Aquatic and Wildlife designation. My theory is let's *give* the effluent to the farmers; then they won't have to pump so much ground water. The delivery system would cost two or three million, but the alternative is $500 to $600 million to save some water bugs."

It's not that he has anything against water bugs, against nature, however. "I can identify birds in the field," he says. "Any one of my kids can identify Southwestern animals. The real environmental issue here is conserving water."

Moore is convincing in a good 'ol boy sort of way, and the trail of cigar ash down the front of his oxford cloth shirt only magnifies this impression.

"It makes business sense," he continues. "One of the ways to strangle growth in this community is to force the community to spend $600 million to waste a valuable commodity. The no-growthers would like that."

And what of the river?

"Before the treatment plant, that riparian area was never there. Let's put in a 500-acre lake, plant 5,000 to 50,000 trees in a linear park."

ONE MIGHT THINK the county would have little trouble in finding takers for effluent. But the problem is finding a way to use *all* the effluent *all* the time. Without a EPA permit, there can be no discharge into any "waterway." Tucson and Pima County agreed in May to spend $200,000 on developing effluent reuse programs, a process which is bound to take longer than the EPA will wait. For the interim, Moore and Pima County

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Photo by Tim Archibald

A riparian catch-22: Birds, mice, grasses and trees have returned to the river since Pima County began discharging effluent there. But now state and federal environmental officials say the water has too much ammonia, chlorine and heavy metal to be safe for wildlife.

RIVER

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Wastewater are looking north, downhill to Marana.

The Cortaro-Marana Irrigation District pumps and delivers water to farms. If you must farm cotton in the desert, this seems a good place to do it: the water table has not dropped since the Santa Cruz effluent began recharging the aquifer, and cropland near the interstate may soon fetch a very fair price for real estate development. Now the county wants to give Marana farmers more water, cheap water loaded with nitrogen (from the ammonia), which is the stuff of fertilizer.

It sounds good, but Bob Condit, manager of the district, says there's a problem: "Farmers don't always need nitrogen. We'll take advantage of it, but cotton needs to be stressed to fruit, and to be defoliated, to get rid of the leaves before picking. The chemical defoliant's ability to work depends on low nitrogen." When the farmers don't want the effluent, it would have to be stored in very large retention basins.

Condit also worries about heavy metals. "Some people are concerned that if you want to sell your land, and somebody does a soil test, there might be environmental problems. You might think your 320 acres is your retirement—but maybe it isn't."

THE SANTA CRUZ flows, the channel narrowing, the current accelerating as we near Big Rapid. It is a big rapid only relative to the rest of the river, but the wind is picking up, roaring through the trees, adding dramatic effect. We run the 10-inch drop smoothly, then, celebrating prematurely, crash into a wall of cattails. Redwing blackbirds erupt, mad and scolding, the black feathers on their shoulders spreading like venetian blinds to expose the red feathers beneath.

After Big Rapid the channel broadens, the stream spreading into braided channels, none carrying enough water to float our boat. I get out, grab the bowline, and drag us along, thinking of Bogart pulling the African Queen.

Big cottonwoods now rise 40 to 50 feet on either side. The rustling of their leaves in the wind sounds exactly right, like water flowing, perfect for a river tree. And the shade beneath seems to improve the prospects of life in general. The idea that someone would want to turn the water off seems impossible.

But it's happened before. When the City of Prescott, Arizona, said it would rather cut the effluent supply to Walker Lake than spend the money to meet the EPA standards, some conservationists thought it was a ploy to win an exemption. Now the lake is gone, the effluent instead going to evaporating ponds. From the dried mud flats of former Walker Lake it can be convincingly argued that an effluent-supplied stream or lake is better than nothing.

It's the sort of unhappy ending that Andy Laurenzi, of the Arizona Riparian Council, hopes to avoid for the birds and trees of the Santa Cruz. "The EPA and ADEQ need to recognize that if it wasn't for the effluent there wouldn't be any wildlife there," says Laurenzi. "Our position is that because the riparian system is dependent on effluent, we should try to maintain at least some of the effluent flow."

This stance has placed environmentalists like Laurenzi in the uncomfortable position of tacitly endorsing effluent standards for the Santa Cruz that are less stringent than those proposed by the State Department of Environmental Quality—if that's what it takes to save the habitat.

Pima County is, in fact, lobbying the ADEQ to relax the proposed standards during "roundtable discussions," public meetings attended largely by toxicologists, engineers and lawyers, the hired guns of municipalities, business and industry.

But if the county succeeds, it will probably be only buying time. Much of the Santa Cruz effluent reaches the underground aquifer. If the effluent quality is not soon improved, the ADEQ will likely require Pima County Wastewater to get an Aquifer Protection Permit.

High on the hit list of potential aquifer contaminants are chlorine and ammonia. Chlorine can form trihalomethanes (THMs), which can cause cancers. Ammonia forms nitrates, which are linked with "blue-baby," a heart-lung circulation defect in newborns. Nobody wants THMs and nitrates sneaking into the ground water. At the same time, nobody wants to spend the money to prevent it unless the risks are large enough to inflame the public ire. Until that day, money talks: "Whatever is done will be the most cost-effective thing to do," says Armstrong.

"What is the worth of the Santa Cruz?" asks Laurenzi. "It's a matter of values—cost, health, beauty. Certainly from the perspective of wildlife it's worth it. I just want to make sure people know what they might lose."

WE LEAVE THE river at Avra Valley Road, dragging the boat up a muddy bank to the edge of the asphalt. The plan is to hitchhike back, with the still-inflated boat as a device to slow the curious. It works: the first car to see us and our boat hits his brakes and stops in a cloud of dust. We trot over as he rolls down his window to ask, "Did you come down the river in that thing?"

Yessir, we sure did.

"Holy smokes, don't you know where that water comes from?"

Yessir, sure do.□

Photo by Tim Archibald

— Wastewater rafters may find their chances have dried up if county efforts to send the effluent to Marana farms are successful.

Jim Malusa is a biologist and writer who likes traveling by foot and bicycle, savors beans, tortillas and Herdez salsa, and hopes to stay in Tucson, his home for the last 18 years. His last story for The Weekly *was "Helicops."*